

BELLCOMM, INC.  
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SUBJECT: AAP System Simplifications  
Resulting from an Unpressurized  
Workshop - Case 620

DATE: December 5, 1968  
FROM: J. J. Sakolosky

MEMORANDUM FOR FILE

In support of the recent ML cost-reduction exercise, a brief investigation was conducted on the effects of not pressurizing the Orbital Workshop. Two cases were considered. In the first case, the unpressurized volume of the OWS would be utilized as an area for conducting EVA/IVA experiments such as M508 and M509. In the second case, the crew would never enter the workshop. For both cases, the crew quarters (food management, waste management, sleep area) and experiment conduction areas were moved to the MDA.

In addition to eliminating or relocating most of the systems currently baselined for the OWS, the deletion of the pressurization requirement results in simplifying or eliminating a number of OWS support functions required of the MDA, AM, and CM-SM. The most significant item eliminated from the MDA is stowage support for experiments M487 (Habitability) and M402 (Orbital Workshop). The AM is predominantly affected at its interfaces with both the OWS and the MDA. A number of OWS interfaces can be eliminated whereas some MDA interfaces require modification. The cryogenic storage requirements of the CM-SM are decreased.

The results of the study were presented to the Deputy Director of AAP, Mr. Disher, and other members of the ML staff on November 27. Copies of the charts used in the presentation are attached.

*J. J. Sakolosky*

1022-JJS-ms

J. J. Sakolosky

Attachments.

(NASA-CR-100287) AAP SYSTEM SIMPLIFICATIONS  
RESULTING FROM AN UNPRESSURIZED WORKSHOP  
(Bellcomm, Inc.) 7 p

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MLS - 11/27/68

UNPRESSURIZED OWS

- ALTERNATIVES
  - USE OWS FOR IVA EXPERIMENTS
  - DON'T ENTER OWS
- FOOD MANAGEMENT, WASTE MANAGEMENT, SLEEP AREA IN MDA
- CONDUCT EXPERIMENTS IN MDA
- OWS SUPPORT REQUIREMENTS ELIMINATED
  - MDA
  - AM
  - CM-SM

OWS HARDWARE ELIMINATED

- IVA CAPABILITY INTO OWS RETAINED
- METEOROID SHIELD
- THERMAL CURTAINS, RAILS, PLENUMS
- FLOOR FLAME RETARDER
- HIGH PERFORMANCE INSULATION
- FANS AND LIGHTS MOUNTING PROVISIONS
- CAUTION AND WARNING SYSTEM
- ECS DUCTING
- SUPPORT FITTINGS LH<sub>2</sub> TANK
- TANK PENETRATION MODIFICATIONS
- EMISSIVITY COATING
- IVA CAPABILITY INTO OWS DELETED (ADDITIONAL HARDWARE ELIMINATED)
- QUICK OPENING HATCH
- INITIAL ENTRY LIGHT
- PROTECTIVE COVERS
- HARDWARE ELIMINATED WHICH RESULTS IN FUNCTIONAL REQUIREMENT ON MDA
- CREW QUARTERS
- MOBILITY AIDS AND RESTRAINTS
- EXPERIMENT ACCOMMODATIONS
- VACUUM OUTLET SYSTEM
- PRE-INSTALLED WIRING AND LIGHTS
- INSTRUMENTATION

OWS HARDWARE RETAINED

- PASSIVATION SYSTEM
- SOLAR ARRAY SYSTEM
- WORKSHOP ATTITUDE CONTROL SYSTEM
- QUICK OPENING HATCH WITH LIGHT }  
  } DELETE IF NO IVA IN OWS
- PROTECTIVE COVERS

MDA HARDWARE

- ELIMINATE SUPPORT FOR M402/M487)
- FIRE EXTINGUISHERS
- LIGHTS AND CONNECTORS
- SEALING PLUGS
- CAUTION AND WARNING SYSTEM
- POWER DISTRIBUTION PANEL
- SIGNAL DISTRIBUTION PANEL
- FANS AND MUFFLERS
- ADD
- FOOD MANAGEMENT, WASTE MANAGEMENT, SLEEP AREA
- EXPERIMENTATION AREA
- INSTRUMENTATION
- ELECTRICAL WIRING

AM HARDWARE

- ELIMINATE
  - HIGH PRESSURE GAS DISTRIBUTION LINE INTERFACE WITH OWS
  - ECS DUCTING INTERFACE WITH OWS
  - SIMPLIFY ELECTRICAL POWER INTERFACE WITH OWS
- MODIFY
  - ECS SUPPORT TO MDA
  - ELECTRICAL POWER SUPPORT TO MDA
  - INSTRUMENTATION SUPPORT TO MDA

WEIGHT AND POWER IMPLICATIONS OF UNPRESSURIZED OWS

- OWS
  - WEIGHT: DECREASE 4600 LBS.
  - POWER: DECREASE 1700 W.
- MDA
  - WEIGHT: DECREASE 600 LBS.
  - POWER: INCREASE 600 W.
- CM-SM
  - WEIGHT: DECREASE 700 LBS.
  - POWER: SAME

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